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## A REEVALUATION OF *Annaphila casta* (Noctuidae)

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THE ORIGINAL DESCRIPTION of *Annaphila casta* Henry Edwards was based on ten female specimens captured by Lord Walsingham in 1872. No males were included in the type series and none were known to exist in collections until recently.

In 1962 one male and three female specimens of *casta* were collected five miles northwest of Corvallis, Benton County, Oregon, thus now allowing further evaluation of the species and its relationship to other species within the genus. For many years it has been standing debate as to whether *casta* is most closely related to its superficially close counterpart *A. diva* Grote, which also possesses whitish secondaries, or whether it is most closely related to the *lithosina-miona* group as is evidenced by the female genitalia.

Dissection of the male specimen was made and the genital organs were mounted on a slide within balsam media. The genital organs were stained with lignin pink to better contrast the weakly sclerotized areas; the vesica of the aedeagus has been inflated to more clearly illustrate cornuti as well as to show the shape of the vesical sac. (Figs. 1, 2)

The specimens of *casta* were given, and in part loaned to the author by the collector, Mr. A. Noel McFarland of Valyermo, California. The genitalic illustration minus the aedeagus was graciously prepared by Mr. Jacques R. Helfer of Mendocino, California, and the aedeagus was illustrated by Miss Judith Jay. Thanks is also due to Dr. Frederick Rindge (American Museum of Natural History), Mr. Michael Gardner, and Mr. William Bauer for their assistance on this project.

### ***Annaphila casta* Henry Edwards**

*Annaphila casta* Henry Edwards, 1890. Ent. Amer. 6:114. J. B. Smith, 1893. Bull. U. S. Natl. Mus. 44:296. Dyar, 1902. Bull. U.S. Natl. Mus. 52:208. Hampson, 1910. Cat. Lep. Phal. Brit. Mus. 9:482, pl. 147, fig. 12. Strand, 1912. Lepidopterorum Catalogus, part 5, page 59. Draudt, 1927. In Seitz, Macrolepidoptera of the World, 7:329, pl. 47f. Rindge and Smith, 1952. Bull. Am. Mus. Nat. Hist. 98(3):228.

Male: Head with front strongly projecting with conical prominence, this prominence clothed in black and white scales, also scantily clothed in red-brown hairs; palpi clothed in black and white hair-like scales; antennae black, with scape and pedicel clothed ventrally in pure white scales, dorsally clothed with banded black and white scales for basal one third, remainder

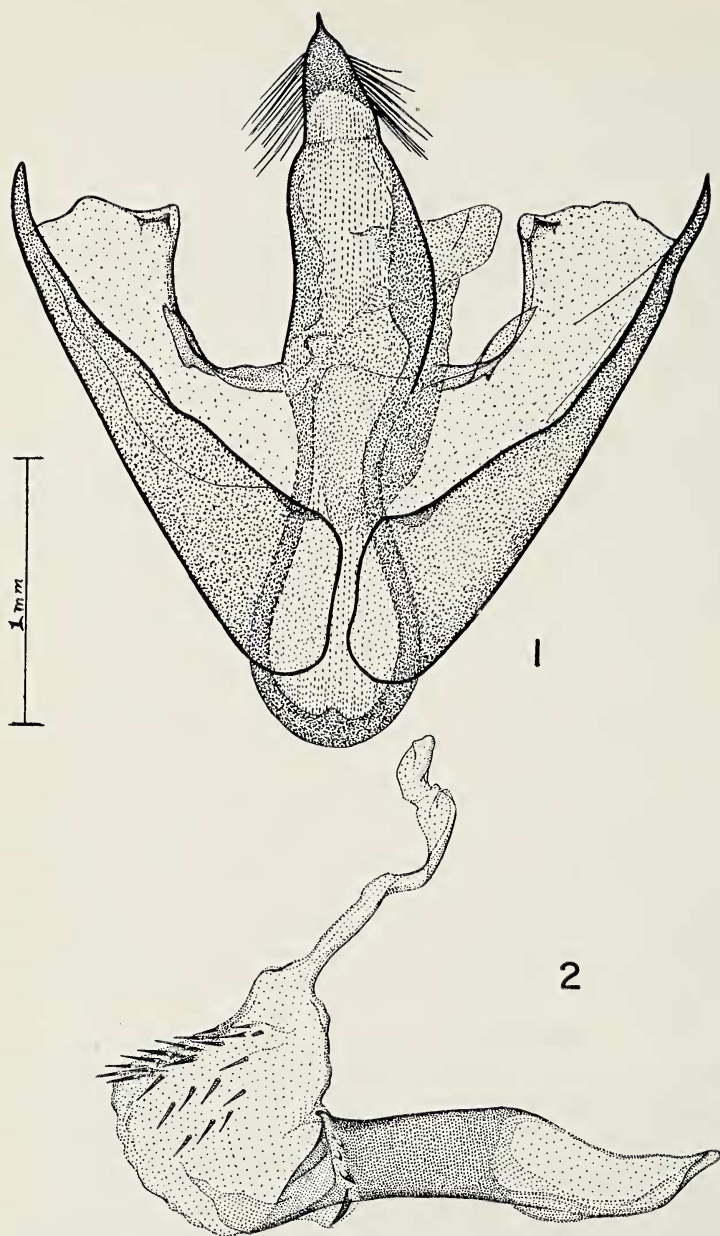


Fig. 1. *Annaphila casta* Henry Edwards, male genitalia minus aedeagus. 5 miles northwest Corvallis, Benton County, Oregon, 16 May 1963 (A. N. McFarland).

Fig. 2. *A. casta*, inflated aedeagus of male genitalia. Data same as in figure 1.

black scaled; thorax with collar of white-tipped black spatulate scales intermixed with longer red-brown hairs; disc with small coal black scales; tegulae clothed in white, black, and various shades of brown spatulate scales, these scales being evenly rounded apically, not dentate; ventrally clothed in pure white hairs; legs with tarsi black and white banded. Primaries with basal line geminate, black, included space olivaceous; basal and transverse anterior areas olivaceous; basal area also with intermingled red-brown hairs; transverse anterior area becoming lighter near transverse anterior line; transverse anterior line black, oblique, reaching furthest apically on medial veins, then irregular to inner margin, scales in areas proceeding transverse anterior line spatulate and not dentate apically; median area smokey black; orbicular hardly discernable, a thin black filled gray circle; broad white band cuts laterally across forewing from costa to inner margin and from basad of reniform to transverse posterior line, the basal line of white band indented medially; reniform appears as thin gray lunule, this lunule being the distad line of reniform proper; distad of reniform appear two circles of dark gray brown scales outlined in white, the lower one being the largest; below these circles wing washed with gray to inner margin; transverse posterior line gray-brown, prominent from costa to middle of wing then indistinct; subterminal area black, disappearing below large circle; subterminal line represented costally by white wedge, then appearing as dividing line between subterminal area and bluish terminal area; terminal line represented by a series of black dots surrounded by blue; fringes smokey black; ventral surface with ground color pure white; lateral black band from costa to inner margin, bordered in gray near inner margin; two circles of dorsal surface represented in soft gray ventrally; region of transverse posterior line black, narrowing broadly from costa to thin line or inner margin; distad of black area with white band, fringes dark, as in figure 4. Secondaries pure white, basally black overlain with white hairs; outer marginal band black; fringes apically black, then pure white; ventral surface pure white; intradiscal line black, weakly defined; discal dot also black, weakly defined; outer marginal band a black patch apically, interrupted by a gray area, this gray area containing two small black dots; outer marginal band represented by elongate black patch at hind angle; fringes pure white, hind wing as in figure 4. Abdomen brown-black, intersegmentally with white annuli; ventrally white.

Greatest expanse of forewing 11 mm.

Female: As in male except antennal ciliations shorter. Greatest length of forewing 12 mm to 13 mm. Female illustrated in figure 3.

Specimens examined: 1 male, 2 females, 16 May-28 May, 1963, McDonald Forest, 5 miles northwest of Corvallis, Benton County, Oregon (A. N. McFarland); 2 females, Sonoma County, California.

*A. casta* is most closely related to *A. miona* Smith as seen by both the male and the female genitalia. There is no problem in superficially distinguishing between *casta* and *miona*, as *miona* possesses yellow-orange secondaries and inhabits the Sierra Nevada range of central and northern California, whereas *casta* possesses pure white secondaries and inhabits the coast and lesser inner ranges, not to mention the great difference in size between the two species. (Fig. 8)

*A. casta* may be superficially distinguished from *diva*, as *diva* possesses creamy white secondaries and is somewhat smaller. The greatest length of the forewing in *diva* varies from 9 mm to 11 mm, whereas in *casta* it varies from 11 mm to 13 mm. For further points of differentiation between *casta* and *diva*, see Rindge & Smith (1952). (Figs. 5 and 6)

As far as the author is concerned, the supposedly solved problem as to where the type locality of *casta* is located is still dubious as it appears in the literature. The original description by Henry Edwards in 1890 states "Oregon Camp No. 9" as the type locality. When

Hampson discussed *casta* in his Catalogue of the Noctuidae in the collection of the British Museum, he had his choice of two camp nines of Walsingham's western United States trip for the type locality of *casta*, and he chose the California Camp 9. He stated the type locality "Hab. U.S.A., California, Mendocino Co., Rancheni Creek (Walsingham) . . .". No date of capture of the type specimen is given. Rindge and Smith state in brackets "Rancheria" following their quote of Hampson's "Rancheni" Creek in Mendocino County. There is no "Rancheni" Creek existing in this area today, at least, but perhaps nearly 100 years ago it did go under this name. There is a Rancheria Creek in this area now which is a tributary of the Navarro River, and this is unquestionably the creek being referred to. The other "Camp 9" is in Oregon, near Oakland. In the details copied from Walsingham's diary by J. H. Durrant, Camp 9 -- "(Caught up wagon) near Oakland 28-IV-1872."

To add to the confusion, Essig (1941) stated for the California Camp 9: "Camp 9. Clearing in redwoods near Navarro River, Mendocino Co., Cal. 29-V-1871." This is correct for the California Camp 9, but is not where *casta* was collected.

Through the kindness of Mr. W. H. T. Tams of the British Museum, the author has before him photostatic copies of Walsingham's personal maps from his library notes as copied by Durrant. These maps cover from below San Francisco Bay, California northward into Washington Territory, and from the Pacific Ocean eastward to mid California and containing all Oregon to Idaho Territory. Unfortunately, the author is unable to reproduce the maps here as the photostatic copies are blurred in places.

As can be seen on the Oregon section of the map, Walsingham marked an "X" to the south of Oakland, between Oakland and Roseburg for his camp 9 where he undoubtedly collected his specimens of *casta*. Mr. McFarland collected his specimens of *casta* in the McDonald Forest, five miles northwest of Corvallis, Oregon. The terrain near Oakland is, in part, very much the same as that found around Corvallis to the north. Both the Oakland and the Corvallis localities are located at approximately the same altitude and are situated equally as far inland from the Pacific Ocean.

In the company of Mr. William Bauer, the author extensively collected the Rancheria Creek area to the "Clearing in redwoods" area along the Navarro River from early March to late in May in the years 1956 through 1960. No *Annaphila casta* were believed to have been seen and none were collected, although *diva* was taken frequently.

There are 2 female specimens of *casta* contained in the American Museum of Natural History collection which the author has examined and they are undoubtedly *casta*. The interesting point is the



- Fig. 3. *A. casta*, female, dorsal aspect. Same locality and collector as in figure 1, collected 28 May 1963.
- Fig. 4. *A. casta*, male, dorsal aspect. Same data as in figure 1.
- Fig. 5. *A. diva* Grote, female, dorsal aspect. Near Feather River, North of Elephant Butte, Plumas County, California, 5 April 1960 (W. R. Bauer & J. S. Buckett).
- Fig. 6. *A. diva*, male, dorsal aspect. Spring Mountain, Sonoma County, California, 31 March 1959 (W. R. B. & J. S. B.).
- Fig. 7. *A. lithosina* Henry Edwards, female, dorsal aspect. Same locality as figure 5, collected 11 June 1959 (J. S. B.).
- Fig. 8. *A. miona* Smith, female, dorsal aspect. Johnsville-LaPorte Road, 14 miles southwest Johnsville, Plumas County, California, 12 June 1961 (W. R. B. & J. S. B.).

data on these specimens: "Sonoma Co. May Cal." and "Sonoma Co. May Calif." The presence of these two specimens is the only supporting evidence of the possibility the "Oregon, Camp 9" of Walsingham might have been in California.

In reference to the California Camp 9, Essig further states, "Caught a small .....?? *Cerostoma* sp. white—smaller than the last species ghost moth—6 spms. (specimens)." This statement of Walsingham's as copied by Essig may be what confused workers into thinking these Plutellids were the specimens of *casta*. Essig later states in regard to the Oregon section of this trip: "Excepting for the map and the few remarks by Carrier, information concerning the trip through Oregon is not available at this time." Therefore, we do not have the Oregon notes to compare to the California notes. Edwards had 10 female specimens of *casta* before him at the time of his original description, whereas Hampson (1910) had only 8 female specimens in the collection of the British Museum for his research in preparation of the "Catlogue". According to Walsingham, he collected only six specimens at the California Camp 9 which could only vaguely suggest *casta*. I doubt that Walsingham, a microlepidopterist, mistook *casta* for a Plutellid or that he miscounted his specimens!

According to the photostatic copies of the maps the author received from Mr. Tams, the map Essig pictured is not the original one used by Walsingham. Essig implies the Oregon map he pictured (which is an 1881 edition) is the one Walsingham used by "Excepting for the map . . ." and "on examining the map it will be seen . . .". These statements appear directly below the map he pictures. In relation to the Oregon Camp 9, Essig states: "Camp 9 may have been set up at Roseburg or vicinity . . .". On the author's photostatic copy, there can be plainly seen an "X" marked in Walsingham's route just below Oakland, Oregon.

Judging from all the information before the author, the type locality of *Annaphila casta* should read: "near Oakland, Oregon, 28 April 1872 (Walsingham)".

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